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Investigations on prediction and identification of cow diseases in the transition period with animal-based indicators

The object of the study was to investigate the ability of animal-based indicators to announce in future occuring diseases, deviating milk yield and metabolic parameters.
A field trial was conducted on a commercial dairy farm in Brandenburg, Germany. In total 417 multiparous cows were examined in the postpartal transition period (between day 1 to 40 post partum). At the days 1 to 6 post partum, 10±2 and 40±4 post partum the animal-based indicators rumen, eye, ear, cleanliness, body temperature, locomotion, claw rotation and stand were assessed. A scoring-system was used to classify the findings of the indicators. At the days 1, 4, 10±2 and 40±4 blood samples were taken and the serum was tested for selected metabolic parameters.
Most findings of animal-based indicators which deviated from the physiological state occurred at the beginning of the postpartal transitionperiod. At the day of calving more cows had insufficient rumenfill (37,4% vs. 9,1), enophtalmic eyes (24,7% vs. 9,3%), cold surface temperature of ears (21,6% vs. 6,5%) and stand restlessness (20,6% vs. 6,7%) than at day 40 post partum. Indicators showed associations over time and different indicators.
Lactation number influenced the body condition at calving day ($p<0,05$). Environmental conditions like straw cleanliness and air temperature influenced significantly cow cleanliness ($p<0,05$), body temperature at calving day and ear surface temperature ($p<0,0001$).
The animal-based indicators were tested separately and in combination for their sensitivity and specifictiy for diseases (retentio secundinarium, endometritis, mastitis, leg diseases). Sensitivity remained almost continuously between 0 to 50% whereas the specifictiy varied between 50 and 100% dependent on indicator or indicator combination. A tight time connection between assessment of indicators and time of diagnosis had a positive influence. Milk yield, somatic cell count as well as bilirubin, GLDH and nonesterified fatty acids showed relative low sensitivities and higher specificities with regard to clinical diseases (retentio secundinarium, mastitis, endometritis) and culling.
The animal-based indicators are able to identify risked animals. A prognostic statement with regard to risk of disease and yield is not possible. Thus the animal-based indicators can be used for decision making for presenation to further veterinary examination.